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(54) Abstract Title

Scaffold base plate utilising a rotatable cam for setting of a scaffold element

(57) A base plate (1, fig 1, not shown) for a scaffolding arrangement has an upwardly facing socket (5) to receive a load bearing element of the scaffold (6). Across the lower part of the socket (5) there is an elongate cam (31, fig 4, not shown) which can rotate about its axis possibly by using an operating arm (35, fig 4, not shown) which extends radially from the cam. The cam (31) has point symmetry in cross section and has a height greater than its width (fig 5, not shown), so that it may support the scaffold element (6) in a first position (fig 5) and then lower the element (6) to a second lower position (fig 6, not shown) when the cam (31), is rotated. Rotation of the cam (31), may be assisted by, for example, a spring (40). A protective housing (17) may enclose the space through which the operating arm (35) travels.

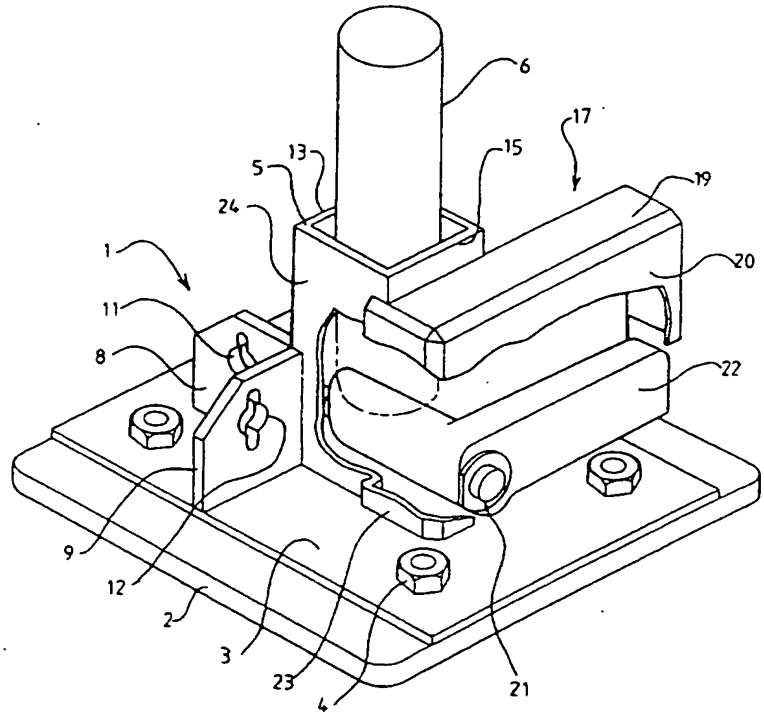

FIG 3

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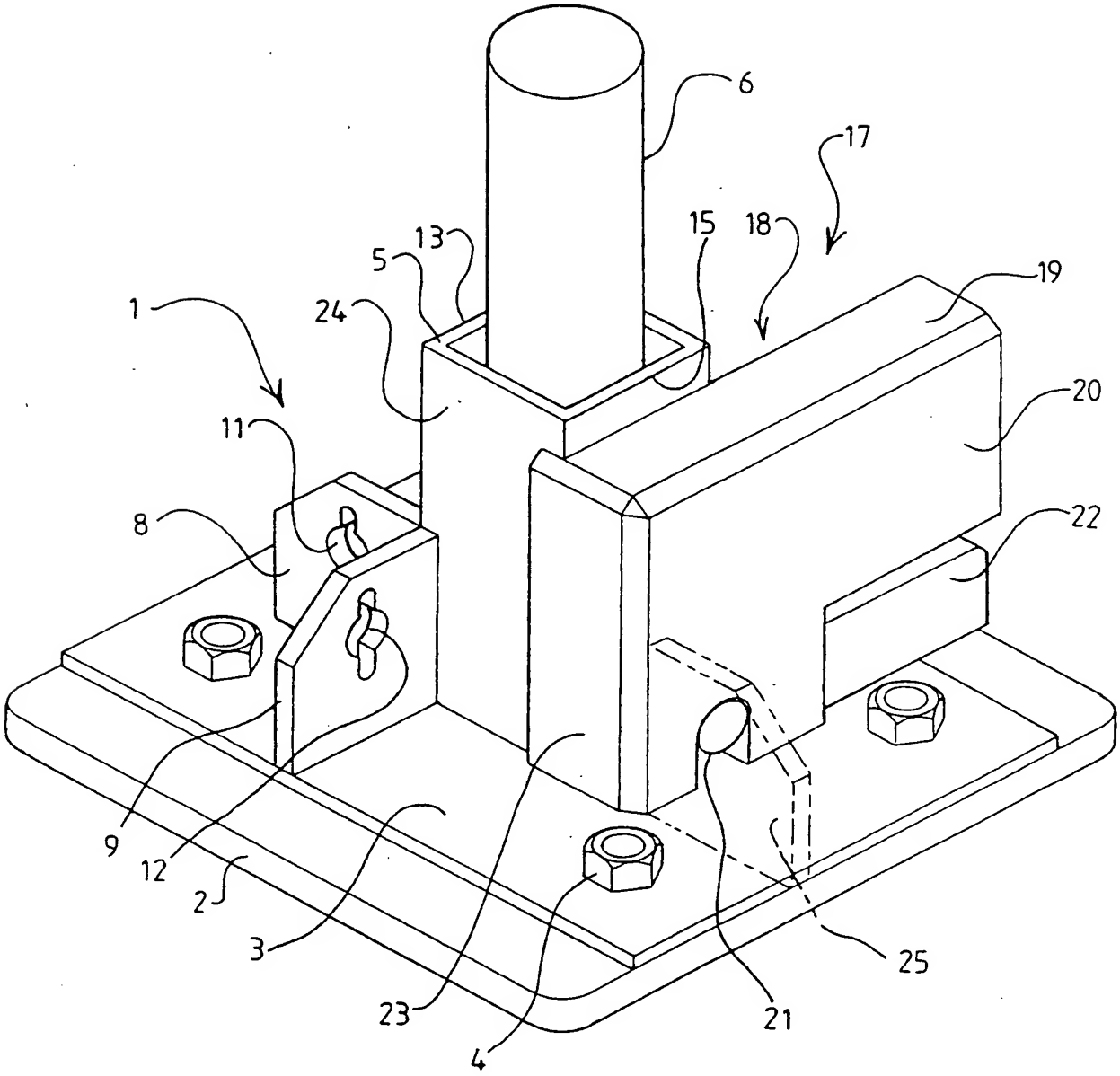
FIG 1



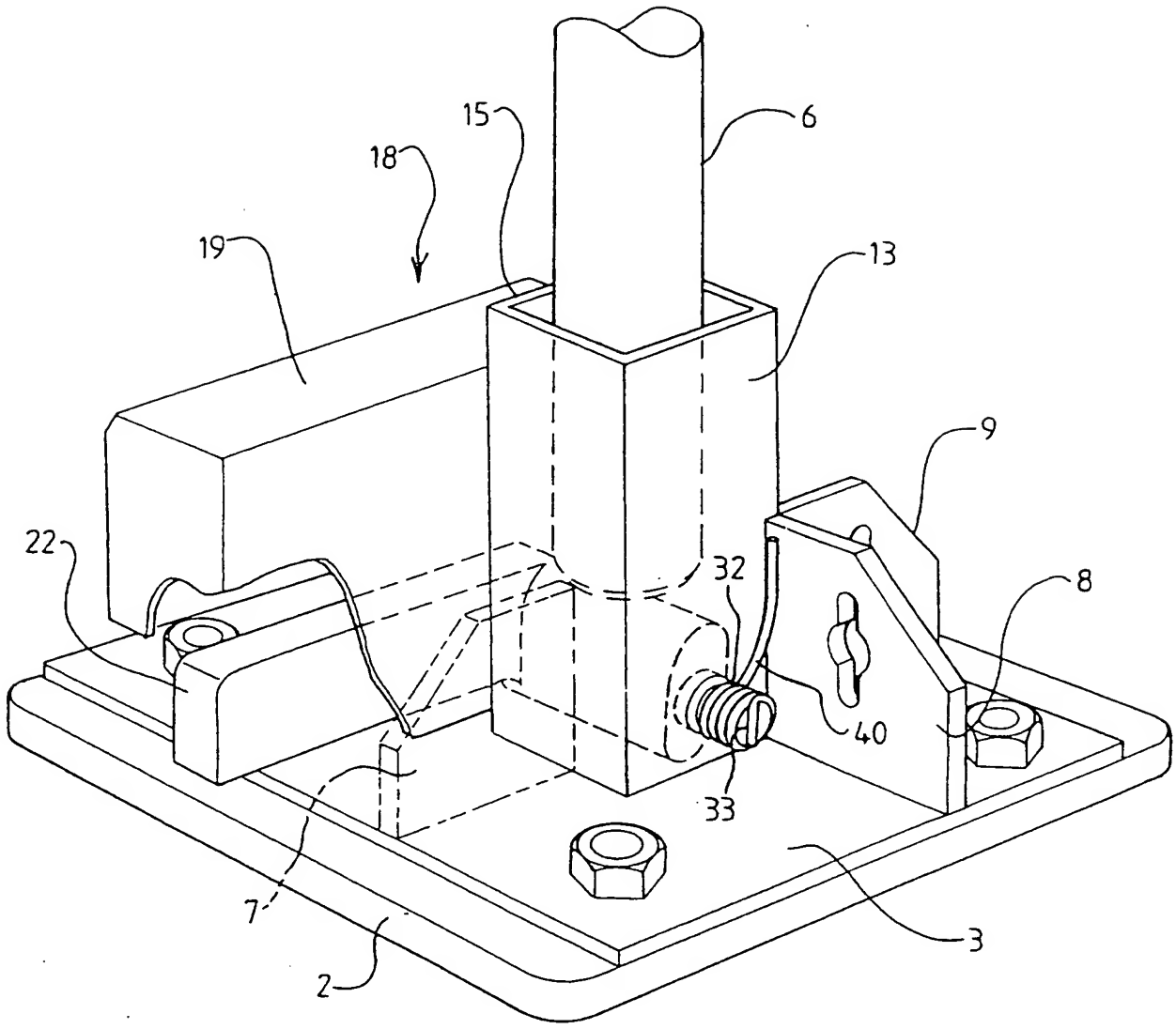


FIG 2

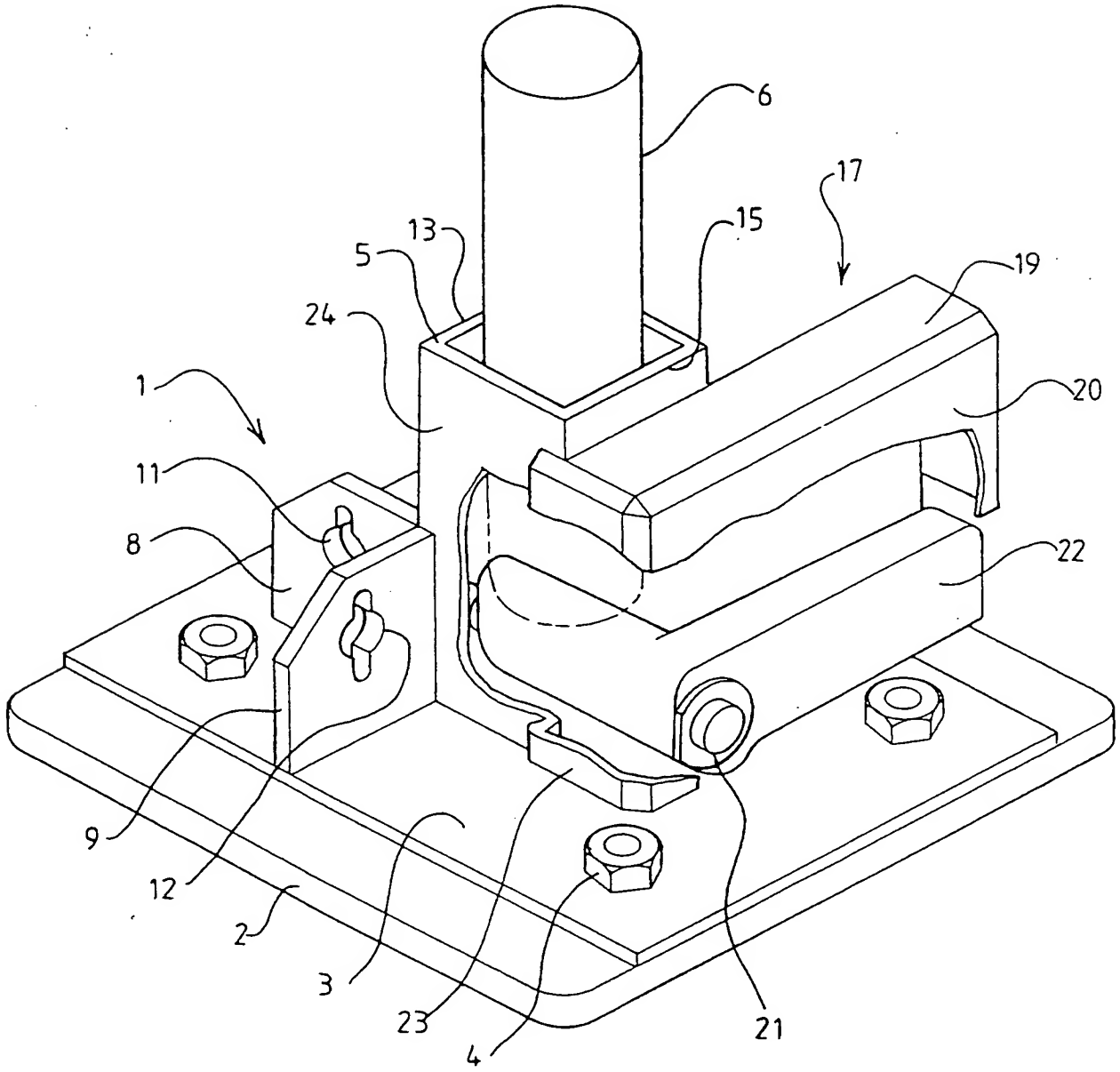
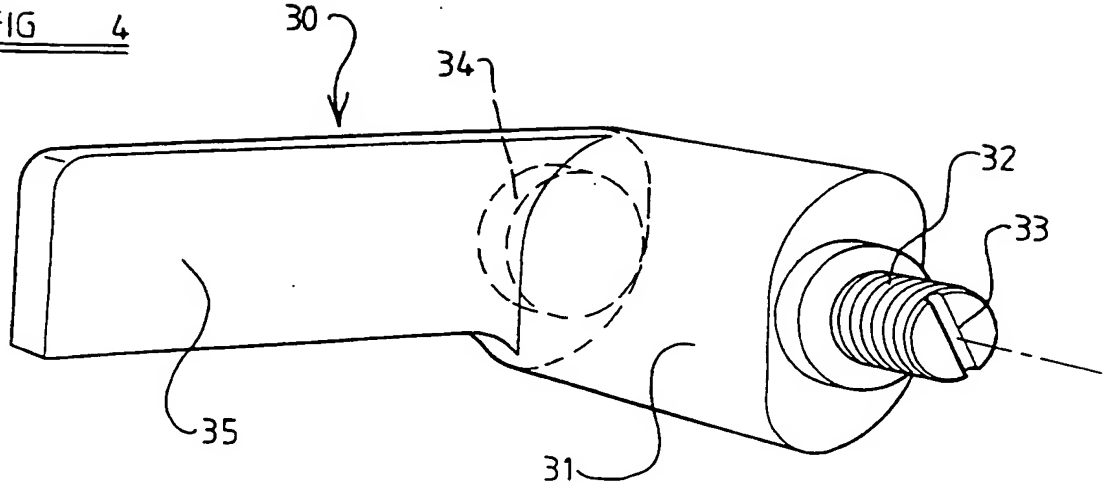


FIG 3

FIG 4



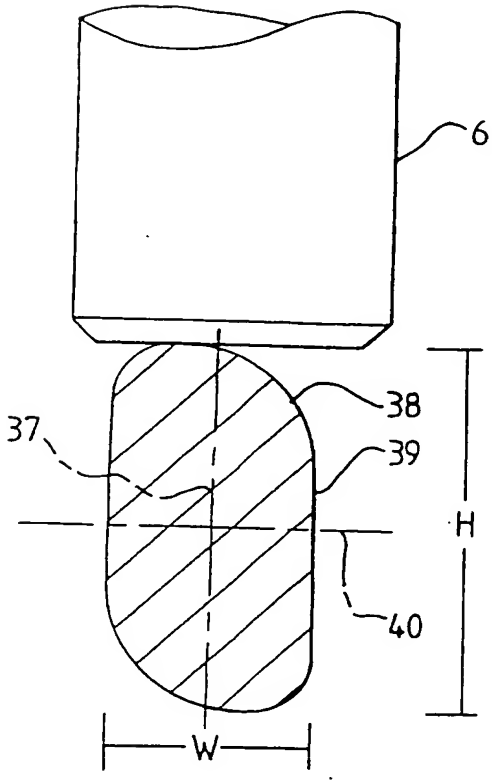


FIG 5

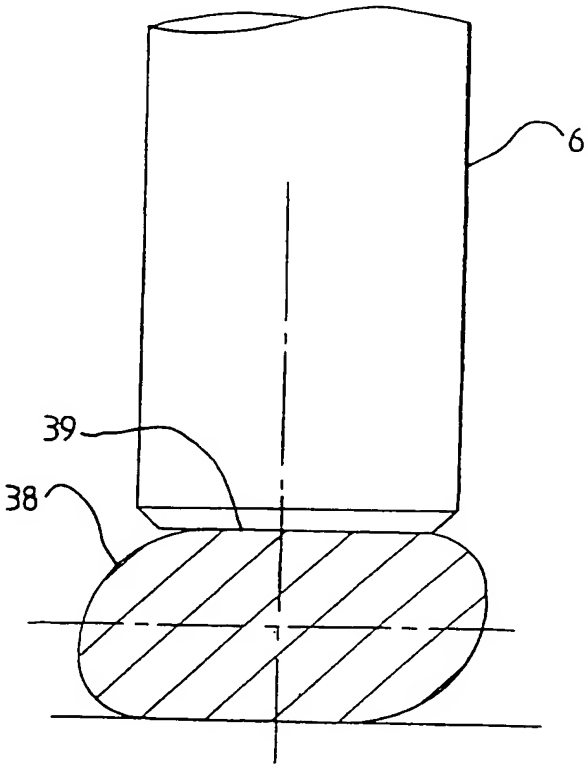


FIG 6

PATENTS ACT 1977

P12821GB-NF/jsd

DESCRIPTION OF INVENTION

"IMPROVEMENTS IN OR RELATING TO A SCAFFOLDING ARRANGEMENT"

THE PRESENT INVENTION relates to a scaffolding arrangement, and more particularly relates to a base plate which is provided with a facility to enable scaffolding supported on the base plate to be "struck" in a quick and efficient manner.

It has been proposed to utilise wedges located under the lower-most parts of the standards of scaffolding assemblies, especially scaffolding assemblies supporting formwork used in the creation of a floor or ceiling in the form of a soffit, each wedge being moveable in such a way that the scaffolding supported by the wedge is lowered slightly. This facilitates the "striking" of the scaffolding supported on the wedge.

The present invention seeks to provide an improved base plate for supporting a scaffolding standard, the base plate having features which facilitate the striking of scaffolding. The invention also seeks to provide a method of assembling and striking scaffolding.

According to one aspect of this invention there is provided a scaffolding arrangement comprising a base plate, the base plate carrying an upwardly open socket dimensioned to receive a load-bearing element forming part of a scaffolding assembly, there being an elongate cam extending transversely across the lower part of the socket, means being provided to rotate the cam about its axis, the arrangement being such that a load-bearing scaffolding element inserted into the socket may engage the cam and be supported in a first position with the cam in an initial position and the element may be lowered to a second position by rotating the cam.

Preferably the said cam is of generally cylindrical form having a cross-section such that the cam, in the initial position, has a height greater than its width, the upper surface of the cam presenting a first portion adapted to engage the load-bearing element, and having a curved or inclined portion adapted to engage the load-bearing element as the cam is rotated so as to lower the load-bearing element.

Conveniently the cam is of a cross-section which has point symmetry.

Advantageously the means adapted to rotate the cam comprise an operating arm which extends substantially radially from said cam on the exterior of said socket.

Conveniently a protective housing is provided adapted to enclose the area of space through which the operating arm will travel as the operating arm is rotated from the first position to the second position.

Advantageously resilient means are provided to bias the cam to the initial position.

Preferably opposed ends of the cam define bosses, the bosses being received in inverted "U"-shaped apertures formed in the socket and/or other parts of the arrangement.,

Conveniently reinforcing plates are provided to reinforce the socket.

The invention also relates to a method of assembling and striking a scaffold assembly that incorporates at least one load-bearing element, said method comprising the steps of inserting the lower end of the load-bearing element into a socket during assembly of the scaffolding, there being a cam extending transversely across the lower part of the socket with which the load-bearing element engaging the cam to support the load-bearing element in a first position, and subsequently, as a step in the striking of the scaffolding, rotating the cam so that the load-bearing element is lowered from the first position to a second position.

Conveniently the socket and cam used in the method form parts of a base plate as described above.

In order that the invention may be more readily understood, and so that further features thereof may be appreciated, the invention will now be described, by way of example, with reference to the accompanying drawings in which:

FIGURE 1 is a perspective view of a scaffolding arrangement in accordance with the invention from one side thereof, with part thereof shown in phantom,

FIGURE 2 is a perspective view of the arrangement of Figure 1 from the other side thereof.

FIGURE 3 is a view corresponding to Figure 1 with a greater part being shown in phantom so that the operative components of the system can be seen,

FIGURE 4 is a perspective view of the cam element,

FIGURE 5 illustrates the operative part of the cam element and the lower part of the scaffolding system before striking, and

FIGURE 6 is a view corresponding to Figure 5 showing the condition that exists after striking.

Referring initially to Figures 1 to 3 of the accompanying drawings, a scaffolding arrangement in accordance with the invention comprises a base plate 1, the base plate being having an underlying substrate 2 to which is secured a horizontal metal support plate 3 by means of studs and co-operating nuts 4. Centrally located in the support plate 3 is a vertically extending square cross-section socket 5. The socket 5 is dimensioned to receive the lower-most part of a load-bearing element in the form of a screw jack 6. The lower-most end of the screw jack 6 is hardened to prevent wear under load.

The socket is reinforced by three up-standing plates 7,8,9, each of which have one edge secured to the socket and an orthogonal edge secured to the support plate 3, for example by welding, so that the plates reinforce the socket. Each plate is provided with an aperture therein 10,11,12. The apertures may receive reinforcing elements that form part of a scaffolding assembly.

One side wall 13 of the socket 5 is provided, at its lower edge, adjacent the plate 8, with an inverted "U"-shaped aperture 14. The aperture provides access to the interior of the socket.

The side wall 15 which is opposite the side wall 13 mentioned above, has the lower part thereof cut away, providing an access 16 from the interior of the socket to the interior of a housing 17 that is formed adjacent the socket 5 and which forms the function of a protective cover. The housing 17 is formed from a first up-standing wall 18 which is secured to the parallel with the side wall 15 and abutted against it, the wall 18 having a cut-away section corresponding with the cut-away formed at the lower part of the wall 15.

The upper edge of the wall 18 supports a forwardly extending upper part 19 of the housing 17, which extends horizontally away from the socket 5 and which carries a depending side wall 20 which is parallel with the wall 18, but spaced therefrom. The wall 20, in the region in alignment with the socket 5, extends down to the level of the support plate and defines, adjacent its lower edge, an inverted "U"-shaped aperture 21. However, the part of the depending wall 20 which is not in alignment with the socket 5 is cut away 22.

The housing 17 incorporates an end wall adjacent the socket in the form of a plate 23 which extends from the depending side wall 20, and past the end of the wall 18 of the housing 17. The plate 23 therefore extends partly adjacent a side wall 24 of the socket, which is positioned between the side wall 15 and the side wall 13. A fourth upstanding reinforcing plate 25, which may be of the same design as one of the reinforcing plates 7,8,9 may be provided secured to the side wall 20 of the housing, and secured to the support plate 3 to reinforce the rigidity of the described arrangement.

The support plate 3 is preferably formed of metal, and at least the area of the support plate that is aligned with the socket is flame-hardened locally to Rockwell C53 to prevent wear under load.

Contained within the described combination of the support plate 3, the socket 5 and the housing 17, is a scaffolding lowering element 30. The lowering element 30 comprises an elongate generally cylindrical cam of an irregular cam cross-section which will be described hereinafter in greater detail with reference to Figures 5 and 6. The element 30 is hardened to prevent wear under load. The cam 31 extends transversely across the lower part of the socket 5, with the axis of the cam being horizontal. At one end, the cam 31 is provided with a cylindrical boss 32 which has, on its end face, a transverse slot 33. At its other end, the cam 31 is provided with a cylindrical boss 34, and adjacent the boss 34 there is a radially extending operating arm 35, which is of linear form. The arm 35 extends perpendicularly to the axis of the cam 31.

The lowering element is contained within the combination of the base plate 3, the socket 5 and the protective housing 17 with the boss 32 projecting through the inverted "U"-shaped aperture 14 formed at the base of the side wall 13 of the socket 5, and with the boss 34 projecting through the inverted "U"-shaped aperture 21 formed in the lower part of the depending side wall 20 of the housing 17. The operating arm 35 is contained within the housing 17 with the operating arm 35 initially being in a horizontal position, adjacent the plate 3, and visible through the cut-out region 22 of the depending side wall 20 of the housing 17.

Referring now to Figure 5, it can be seen that the horizontally extending cam 31 has a cross-section such that in the initial position of the cam 31 the height H of the cam 31 is substantially greater than the width W. The cam 31

presents, on its upper surface, a flat region 36 located to one side of a vertical centre-line 37 and a downwardly curved surface 38 to the other side of the centre-line 37. The downwardly curved surface 38 merges with a vertical face 39 provided on the cam 31. It can be seen that the cam 31 has a cross-section which has point symmetry about the inter-section of the vertical centre-line 37 and a horizontal centre-line 40.

A resilient element in the form of a spring 41 is provided having one end engaged with the slot 33 and having its other end engaging the plate 8. The spring 41 is wound around the boss 32 and provides a biasing motion tending to rotate the cam 31 in a clockwise direction from the perspective of Figures 1, 2, 5 and 6 to the initial position in which the operating arm 35 is in alignment with the cut-away region 22 of the side wall 20 of the housing 17.

The base plate thus described as ready for operation, and a load-bearing element, in the form of a screw jack 6, may have the lower end thereof inserted within the socket 5, with the lowest part of the screw jack 6 engaging the flat region 36 of the cam 31, which extends across the lower part of the socket 5. The screw jack 6 will be associated with other scaffolding elements which are supported by the jack. A full scaffolding structure may be built using a plurality of screw jacks, each being associated with a base plate as described, and each supporting part of the scaffolding structure.

When the scaffolding is to be struck, a crow-bar of the like may be utilised to access the operating arm 35 of the cam 31 of the illustrated base plate 1 through the cut-out 22, and the operating arm 35 may be moved to initiate rotation of the cam 31. The cam 31 rotates about a horizontal axis. Rotation of the cam 31 in this way causes the curved portion 38, provided towards the top of the cam 31, to engage the under-side of a screw jack, whilst

the mirror-image curved surface at the lower part of the cam 31 moves across the hardened portion of the base plate. Rotation of the cam 31 continues until the face 39 on the cam 31 engages the lower end of the jack 6, and the opposite face engages the upper surface of the plate 3. The centre of the cam 31 is thus lowered, and also the scaffolding jack 6 supported on the cam 31 is lowered.

Once the cam 31 has started to move, the weight of the scaffolding will force the cam 31 to continue to move until the cam 31 reaches the position shown in Figure 5 in which the cam 31 has rotated through 90°. This is the final position of the cam. It can be seen that the screw jack 6 is now supported only a distance W above the level of the support plate 3, whereas initially it was supported as H above the surface of the support plate 3. Since W is less than H, the jack 6 has actually been lowered.

It is to be appreciated that once the motion of the cam 31 has been initiated, the weight of the scaffolding will force the cam to move to the final position shown in Figure 5 very rapidly, and the operating arm 35 will move very swiftly through an arc of substantially 90^0. As the operating arm 35 moves through this arc of 90^0 it moves into the hollow interior of the protective housing 17, thus minimising the risk of the operating arm 35 inadvertently engaging with a scaffolding worker during striking of the scaffolding.

When the cam has been operated, the scaffolding will still apply a substantial downward force on the cam preventing the cam from rotating back to the initial position as shown in Figure 4. However, when the screw jack has been removed from the socket 5, the spring 40 will return the cam to its initial position, and the described base plate arrangement is then ready for re-use.

In the case of a scaffolding structure in which a plurality of base plates are provided, the cams of the base plates will be operated sequentially, to lower all of the jacks of the scaffolding structure, before striking of the scaffolding structure is completed.

CLAIMS:

1. A scaffolding arrangement comprising a base plate, the base plate carrying an upwardly open socket dimensioned to receive a load-bearing element forming part of a scaffolding assembly, there being an elongate cam extending transversely across the lower part of the socket, means being provided to rotate the cam about its axis, the arrangement being such that a load-bearing scaffolding element inserted into the socket may engage the cam and be supported in a first position with the cam in an initial position and the element may be lowered to a second position by rotating the cam.

2. An arrangement according to Claim 1 wherein the said cam is of generally cylindrical form having a cross-section such that the cam, in the initial position, has a height greater than its width, the upper surface of the cam presenting a first portion adapted to engage the load-bearing element, and having a curved or inclined portion adapted to engage the load-bearing element as the cam is rotated so as to lower the load-bearing element.

3. An arrangement according to Claim 2, wherein the cam is of a cross-section which has point symmetry.

4. An arrangement according to any one of the preceding Claims wherein the means adapted to rotate the cam comprise an operating arm which extends substantially radially from said cam on the exterior of said socket.

5. An arrangement according to Claim 4 wherein a protective housing is provided adapted to enclose the area of space through which the operating arm

will travel as the operating arm is rotated from the first position to the second position.

6. An arrangement according to any one of the preceding Claims wherein resilient means are provided to bias the cam to the initial position.

7. An arrangement according to any one of the preceding Claims wherein opposed ends of the cam define bosses, the bosses being received in inverted "U"-shaped apertures formed in the socket and/or other parts of the arrangement.

8. A scaffolding arrangement according to any one of the preceding Claims wherein reinforcing plates are provided to reinforce the socket.

9. A method of assembling and striking a scaffold assembly that incorporates at least one load-bearing element, said method comprising the steps of inserting the lower end of the load-bearing element into a socket during assembly of the scaffolding, there being a cam extending transversely across the lower part of the socket with which the load-bearing element engaging the cam to support the load-bearing element in a first position, and subsequently, as a step in the striking of the scaffolding, rotating the cam so that the load-bearing element is lowered from the first position to a second position.

10. A method according to Claim 9 wherein the socket and cam form parts of a base plate according to any one of Claims 1 to 8.

11. A scaffolding arrangement substantially as herein described with reference to and as shown in the accompanying drawings.

12. A method of assembling and striking a scaffold assembly substantially as herein described with reference to the accompanying drawings.

13. Any novel feature or combination of features disclosed herein.

Application No:	GB 9827004.4	**Examiner:**	Lyndon Ellis
Claims searched:	1-13	**Date of search:**	3 April 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): E1S SSL

Int Cl (Ed.7): E04G 11/48

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	US 3915423 Acrow (Engineers) Limited	-

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.